



FOREST CONTROL

by

CONTINUOUS INVENTORY

"Today I have grown taller from walking
with the trees."

...Karle Wilson

Milwaukee, Wis. October, 1962 No. 103

IF TREES COULD SPEAK

By Elmer C. Adams

If trees could speak, with what a voice
Of eloquence they would rejoice
Recounting gaily one by one
The things they've known and been and done:
The stir of life in buried seed;
The groping roots; the sprouts that heed
The urge of sun and rain to rise
Aspiring toward the kindly skies;
The stem, the bough, the leaf, the flower
Full grown in symmetry and power --
O, marvels never far to seek
If trees, to tell of them, could speak!

If trees could speak, with what a wail
Man's ruthlessness they would assail,
Displaying to his guilty sense
Their pitiful experience:
The "Timber!" shout; the rending crash;
The bleeding stumps amid the slash;
The briars, the ruts, the flood, the fire,
Base fruit of greed and base desire,
Ruin and ashes strewn abroad
Insulting nature and its god --
What crimson shame would dye man's cheek
If trees, accusing him, could speak.

FORESTRY SCHOOL LIBRARY

COPY NO. _____



BINDERS, HEADERS AND SEPARATORS FOR CFI DATA TABULATIONS

Credit is never so important as accomplishment. Nevertheless, when accomplishment may be broadened and intensified by giving credit, we are most happy to do so.

The binders, headers and separators with this Newsletter are a most desirable innovation in permanent inventory data presentation. Developed by Don Pallin of George Banzhaf & Company, Consultants, Milwaukee, Wisconsin, this method of compiling CFI results deserves widespread use. Foresters are sometimes lax in the presentation of detailed forest facts. Here is an opportunity to correct one facet of this failing.

These binders, headers and separators were prepared for The Cleveland-Cliffs Iron Company of Cleveland, Ohio, as a part of the overall responsibility for CFI planning, installation and computation. Cleveland-Cliffs is making good use of these figures from the forest and is preparing from them many words of wisdom for its management. Company foresters, administrators and executives will find the material in its present excellent format especially helpful when the first repeat measurements are made in 1965. There will be many a true tale about the timber in these comparable records of the Company's 1107 fixed radius CFI plots, all of which will be recovered and measured again by company cruisers.

ADVANTAGES OF THE BINDER PAGES

There are distinct advantages in this Banzhaf book of binder pages for processed inventory data.

1. It gives a masterful and professional appearance to the basic details of CFI work.
2. It gives a logical order and coherence to great masses of heterogeneous material from which summarized reports are prepared.
3. It protects and preserves the many pages of CFI records common to repetitive forest control inventories.
4. It encourages a constant comparison of records. This is so necessary and important to permanent CFI and to permanent forest management.

DESCRIPTION OF THE BINDER PAGES

More than 50 pages of separators are found in the Banzhaf book of binders. The information covers details about the 346,000 acre Michigan forests of The Cleveland-Cliffs Iron Company. Per acre and expanded volumes are given for every breakdown of the total forest area.

The first page is a table of contents in detail. It shows the four major types of information recorded and compiled.

Area breakdown tables follow. These tables give net commercial volumes for all species combined for every area breakdown and combination thereof.

Stand and Stocking tables are included in the binder. These tables provide a measure of the stand structure or distribution of trees by species and diameter class for all forest cover, size and density classes.

To aid in the determination of the allowable cut, summaries of data by chronological cutting periods and by size classes are shown. Tree details include volumes by species groups and by tree vigor and management potential classes.

Volumes and lengths per tree are given with the final separator. Useful for technical purposes and for comparisons by species, this information is later curved to show net volume and length per tree in 2" DBH classes.

STANDARDIZING HEADINGS IS IMPORTANT

It is essential that the headings on the separator pages match perfectly the position of the intervening data tabulation sheets. To make certain of this matching, form layouts are prepared for all tabs and listings in advance of the machine work and no modifications can subsequently be made. Each flow chart session for machine planning requires planning also for the ultimate binding of the records.

GENERAL COMMENTS AND COSTS

The North Central Region has more than a dozen large industrial CFI cases, many of which have had at least one remeasurement. Each company has, in an individualistic manner, bound, or filed without binding, all of its voluminous records. This is the first opportunity we have had to offer a standard system for storage. Costing between \$150 and \$200 in the local, private printing office, this Banzhaf book of binder pages dresses up the most detailed inventory control data in a most efficient manner. Its cost is a small sum to pay for the convenience of well bound and classified CFI references and records.

CAL STOTT
Forester

Continuous Forest Inventory
1961 REPORT

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DISTRICT
NUMBER
OF
PLOTS
COVER
SIZE
DENSITY
UND. REP.
CUT. PER.
SITE
OPER.
DECK
NUMBER

AREA BREAK TABLES — Per Acre and Expanded Values

TOTAL FOREST VALUES					PER ACRE VALUES				
EXPANDED VOLUME	EXPANDED VOLUME	EXPANDED AREA ACRES	EXPANDED VOLUME	EXPANDED VOLUME	NO. TREES	VOLUME BOARD FEET	NO. TREES	PURPOOD VOLUME STD. CORUS	BASAL AREA SQ. FEET
*****x.	*****x.	*****x.	*****x.	*****x.	x.x.0	*****x.0	x.x.0.0	x.x.x.0.0	*****x.0

Master Code List

- DISTRICT

1. Newberry

2. Munising

3. Marquette
- NUMBER OF PLOTS

The Actual Number of Plots Falling Within Each Area Breck
- COVER

Cover Group 1

11. Northern Hardwoods

12. Hardwood-Hemlock

13. Hemlock

14. Swamp Hardwoods

Cover Group 2

21. Paper Birch

22. Aspen

Cover Group 3

31. Spruce-Fir

32. Black-Spruce

33. Mixed Conifer Swamp

34. White Cedar

35. Tamarack

Cover Group 4

41. White Pine

42. Red Pine

43. Jack Pine

Cover Group 8

88. Temporarily Non-Productive

Cover Group 9

99. Permanently Non-Productive
- SIZE CLASS

1. Sawtimber

2. Poletimber

3. Seedlings and Saplings

8. Temporarily Non-Productive

9. Permanently Non-Productive
- DENSITY

1. Well Stocked

2. Medium Stocked

3. Poorly Stocked

8. Temporarily Non-Productive

9. Permanently Non-Productive
- SITE

1. Good Site

2. Medium Site

3. Poor Site

8. Temporarily Non-Productive

9. Permanently Non-Productive
- OPERABILITY

1. Year Around

2. Summer Only

3. Winter Only

8. Temporarily Non-Productive

9. Permanently Non-Productive
- UNDERSTORY REPRODUCTION

1. Adequate Desirable

2. Adequate Undesirable

3. Inadequate Desirable

4. Inadequate Undesirable

8. Temporarily Non-Productive

9. Permanently Non-Productive
- CUTTING PERIOD

1. Should Be Cut Within 5 Years

2. Should Be Cut 5-10 Years in Future

3. Should Be Cut After 10 Years

8. Temporarily Non-Productive

9. Permanently Non-Productive
- SPECIES

Species Group 1

11. Hard Maple

12. Soft Maple

13. Beech

14. Yellow Birch

15. White Ash, Red Oak, Black Cherry, Basswood

Species Group 2

22. Hemlock

Species Group 3

31. Elm

32. Black Ash

Species Group 4

41. Paper Birch

42. Aspen

Species Group 5

51. White Pine

52. Red Pine

53. Jack Pine

Species Group 6

61. White Spruce

62. Black Spruce

63. Balsam Fir

Species Group 7

71. Tamarack

72. White Cedar

Species Group 8

81. Other Commercial Species

82. Other Non-Commercial Species

DBH CLASS

Trees Grouped into 2" Diameter Classes

INDIVIDUAL TREE VIGOR

1. Good Vigor

2. Medium Vigor

3. Poor Vigor

4. Cull and Chemical

MANAGEMENT POTENTIAL

1. Tree species handled under selective cutting practices. Healthy trees that should not be cut.

2. Tree species handled under clear cutting practices. Good healthy trees that would be cut if the area were cut.

4. Trees that should be cut because they are mature or over-mature.

5. Trees that should be cut because they are a poor risk or poor form.

6. Trees that should be cut in a thinning.

8. A tree that should be cut but is non-commercial due to size.

DISTRICT
NUMBER
OF
PLOTS
COVER
SIZE
DENSITY
SPECIES
d.b.h. CL.
DECK
NUMBER

STAND AND STOCKING TABLES — Per Acre and Expanded Values

TOTAL FOREST VALUES				PER ACRE VALUES					
EXPANDED VOLUME	EXPANDED VOLUME	EXPANDED AREA	EXPANDED AREA	SAWTIMBER NO. TREES	VOLUME BOARD FEET	NO. TREES	PULPWOOD VOLUME BOARD FEET	VOLUME SQ. FEET	BASAL AREA SQ. FEET
*****.	*****.	*****.	*****.	*****.	*****.	*****.	*****.	*****.	*****.

Master Code List

- DISTRICT

1. Newberry

2. Munising

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- NUMBER OF PLOTS

The Actual Number of Plots Falling Within Each Area Break
- COVER

Cover Group 1

11. Northern Hardwoods

12. Hardwood-Hemlock

13. Hemlock

14. Swamp Hardwoods

Cover Group 2

21. Paper Birch

22. Aspen

Cover Group 3

31. Spruce-Fir

32. Black-Spruce

33. Mixed Conifer Swamp

34. White Cedar

35. Tamarack

Cover Group 4

41. White Pine

42. Red Pine

43. Jack Pine

Cover Group 8

88. Temporarily Non-Productive

Cover Group 9

99. Permanently Non-Productive
- SIZE CLASS

1. Sawtimber

2. Poletimber

3. Seedlings and Saplings

8. Temporarily Non-Productive

9. Permanently Non-Productive
- DENSITY

1. Well Stocked

2. Medium Stocked

3. Poorly Stocked

8. Temporarily Non-Productive

9. Permanently Non-Productive
- SITE

1. Good Site

2. Medium Site

3. Poor Site

8. Temporarily Non-Productive

9. Permanently Non-Productive
- OPERABILITY

1. Year Around

2. Summer Only

3. Winter Only

8. Temporarily Non-Productive

9. Permanently Non-Productive
- UNDERSTORY REPRODUCTION

1. Adequate Desirable

2. Adequate Undesirable

3. Inadequate Desirable

4. Inadequate Undesirable

8. Temporarily Non-Productive

9. Permanently Non-Productive
- CUTTING PERIOD

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11. Hard Maple

12. Soft Maple

13. Beech

14. Yellow Birch

15. White Ash, Red Oak, Black Cherry, Basswood

Species Group 2

22. Hemlock
- Species Group 3

31. Elm

32. Black Ash

Species Group 4

41. Paper Birch

42. Aspen

Species Group 5

51. White Pine

52. Red Pine

53. Jack Pine

Species Group 6

61. White Spruce

62. Black Spruce

63. Balsam Fir

Species Group 7

71. Tamarack

72. White Cedar

Species Group 8

81. Other Commercial Species

82. Other Non-Commercial Species
- DBH CLASS

Trees Grouped into 2" Diameter Classes
- INDIVIDUAL TREE VIGOR

1. Good Vigor

2. Medium Vigor

3. Poor Vigor

4. Cull and Chemical
- MANAGEMENT POTENTIAL

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6. Trees that should be cut in a thinning.

8. A tree that should be cut but is non-commercial due to size.

99	2 1 15	4 61	669696	1823	3095235	10	216	187	59	21
99	2 1 15	5 61	585124	1074	3095235	35	189	56	35	82
99	2 1 15	6 61	1782104*	4689*		80*	575*	354*	152*	181
99	2 1 22	2 61	506493	2726	3095235	35	164	96	88	69
99	2 1 22	5 61	629364	7066	3095235	35	203	116	228	134
99	2 1 31	1 61	1135857*	9792*		70*	367*	212*	316*	203
99	2 1 31	5 61	925444	5781	3095235	56	289	253	187	131
99	2 1 31	6 61	130531	2809	3095235	10	42	141	91	56
99	2 1 32	1 61	1055975*	12074*		66*	341*	556*	391*	237
99	2 1 32	5 61	211977	1867	3095235	15	68	126	60	33
99	2 1 32	5 61	211977*	3520	3095235	15*	68*	217	114	79
99	2 1 41	2 61	240897	8753	3095235	20	78	449	283	149
99	2 1 41	4 61	93795	638	3095235	10	30	15	21	20
99	2 1 41	5 61	861663	6345	3095235	66	278	308	205	176
99	2 1 42	2 61	1196355*	15736*		96*	386*	772*	509*	345
99	2 1 42	4 61	50649	27870	3095235	5	16	1374	900	367
99	2 1 42	5 61	154293	3742	3095235	10	50	86	121	51
99	2 1 42	5 61	426611	18123	3095235	25	138	803	586	283
99	2 1 42	6 61	631553*	50420*		40*	204*	2283*	1629*	710
99	2 1 51	1 61	1457418	4390	3095235	56	471	167	142	128
99	2 1 51	5 61	917940	5554	3095235	15	297	81	179	103
99	2 1 53	2 61	2375358*	9944*		71*	768*	248*	321*	231
99	2 1 53	4 61	37674	6811	3095235	5	12	162	220	77
99	2 1 53	5 61	37674*	1765	3095235	5*	12*	223*	291*	104
99	2 1 61	2 61	167893	4635	3095235	10	54	162	150	84
99	2 1 61	5 61	61123	2417	3095235	5	20	40	78	36
99	2 1 62	1 61	229016*	7052*		15*	74*	202*	228*	120
99	2 1 62	4 61	37405	49	3095235	5	1758	1208	535	1
99	2 1 62	5 61	8610	3095235			121	278	98	
99	2 1 62	5 61	9309	3095235			425	301	153	
99	2 1 63	1 61	55369*	*		*	2339*	1788*	767	
99	2 1 63	4 61	16452	3095235			1434	932		
99	2 1 63	4 61	2995	3095235			86	97		

DISTRICT
NUMBER
OF
PLOTS
SIZE
CUT, PER
SPECIES
VIGOR
MGT. POT
DECK
NUMBER

CUTTING PERIOD TABLES — Per Acre and Expanded Values

TOTAL FOREST VALUES					PER ACRE VALUES				
EXPANDED VOLUME	EXPANDED VOLUME	EXPANDED AREA	EXPANDED STD. CORRS	EXPANDED ACRES	SAWTIMBER NO. TREES	VOLUME BOARD FEET	PUTWOOD NO. TREES	VOLUME STD. CORRS	BASAL AREA SQ. FEET
*****.	*****.	*****.	*****.	*****.0	*****.0	*****.0	*****.0	*****.0	*****.0

43a

Master Code List

- DISTRICT

1. Newberry

2. Munising

3. Marquette
- NUMBER OF PLOTS

The Actual Number of Plots Falling Within Each Area Break
- COVER

Cover Group 1

11. Northern Hardwoods

12. Hardwood-Hemlock

13. Hemlock

14. Swamp Hardwoods-

Cover Group 2

21. Paper Birch

22. Aspen

Cover Group 3

31. Spruce-Fir

32. Black-Spruce

33. Mixed Conifer Swamp

34. White Cedar

35. Tamarack

Cover Group 4

41. White Pine

42. Red Pine

43. Jack Pine

Cover Group 8

88. Temporarily Non-Productive

Cover Group 9

99. Permanently Non-Productive
- SIZE CLASS

1. Sawtimber

2. Poletimber

3. Seedlings and Saplings

8. Temporarily Non-Productive

9. Permanently Non-Productive
- DENSITY

1. Well Stocked

2. Medium Stocked

3. Poorly Stocked

8. Temporarily Non-Productive

9. Permanently Non-Productive
- SITE

1. Good Site

2. Medium Site

3. Poor Site

8. Temporarily Non-Productive

9. Permanently Non-Productive
- OPERABILITY

1. Year Around

2. Summer Only

3. Winter Only

8. Temporarily Non-Productive

9. Permanently Non-Productive
- UNDERSTORY REPRODUCTION

1. Adequate Desirable

2. Adequate Undesirable

3. Inadequate Desirable

4. Inadequate Undesirable

8. Temporarily Non-Productive

9. Permanently Non-Productive
- DBH CLASS

Trees Grouped into 2" Diameter Classes
- INDIVIDUAL TREE VIGOR

1. Good Vigor

2. Medium Vigor

3. Poor Vigor

4. Cull and Chemical
- MANAGEMENT POTENTIAL

1. Tree species handled under selective cutting practices. Healthy trees that should not be cut.

2. Tree species handled under clear cutting practices. Good healthy trees that would be cut if the area were cut.

4. Trees that should be cut because they are mature or over-mature.

5. Trees that should be cut because they are a poor risk or poor form.

6. Trees that should be cut in a thinning.

8. A tree that should be cut but is non-commercial due to size.
- Species Group 3

31. Elm

32. Black Ash
- Species Group 4

41. Paper Birch

42. Aspen
- Species Group 5

51. White Pine

52. Red Pine

53. Jack Pine
- Species Group 6

61. White Spruce

62. Black Spruce

63. Balsam Fir
- Species Group 7

71. Tamarack

72. White Cedar
- Species Group 8

81. Other Commercial Species

82. Other Non-Commercial Species

DISTRICT
NUMBER
OF
PLOTS

SPECIES

d.b.h. CL
DECK
NUMBER

PER TREE VALUES — Volume and Length per Tree

VOL. PER TREE			LEN. PER TREE			SUM OF		
SWT.G.	PLWD.		SWT.G.	PLWD		TREE LENGTHS		
BD. FT.	CORDS		FEET	FEET		SAWLOOS	PULP.WD.	
x x x .0	x .0 0 0		x x .0	x x .0		x x x x x .	x x x x x .	

SAMPLE PLOT VALUES							BASAL	
SAWTIMBER			PULPWOOD				AREA	
NO.	VOLUME		NO.	VOLUME			SQ. FEET	
TREES	BOARD FEET		TREES	STD. CORDS				
x x x x .	x x x x x x .0		x x x x x .	x x x x 0 0 0			x x x x x .0 0	

Master Code List

DISTRICT

- 1. Newberry
- 2. Munising
- 3. Marquette

NUMBER OF PLOTS

The Actual Number of Plots Falling Within
Each Area Break

COVER

Cover Group 1

- 11. Northern Hardwoods
- 12. Hardwood-Hemlock
- 13. Hemlock
- 14. Swamp Hardwoods

Cover Group 2

- 21. Paper Birch
- 22. Aspen

Cover Group 3

- 31. Spruce-Fir
- 32. Black-Spruce
- 33. Mixed Conifer Swamp
- 34. White Cedar
- 35. Tamarack

Cover Group 4

- 41. White Pine
- 42. Red Pine
- 43. Jack Pine

Cover Group 8

- 88. Temporarily Non-Productive

Cover Group 9

- 99. Permanently Non-Productive

SIZE CLASS

- 1. Sawtimber
- 2. Poletimber
- 3. Seedlings and Saplings
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

DENSITY

- 1. Well Stocked
- 2. Medium Stocked
- 3. Poorly Stocked
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

SITE

- 1. Good Site
- 2. Medium Site
- 3. Poor Site
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

OPERABILITY

- 1. Year Around
- 2. Summer Only
- 3. Winter Only
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

UNDERSTORY REPRODUCTION

- 1. Adequate Desirable
- 2. Adequate Undesirable
- 3. Inadequate Desirable
- 4. Inadequate Undesirable
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

CUTTING PERIOD

- 1. Should Be Cut Within 5 Years
- 2. Should Be Cut 5-10 Years in Future
- 3. Should Be Cut After 10 Years
- 8. Temporarily Non-Productive
- 9. Permanently Non-Productive

SPECIES

Species Group 1

- 11. Hard Maple
- 12. Soft Maple
- 13. Beech
- 14. Yellow Birch
- 15. White Ash, Red Oak, Black Cherry, Basswood

Species Group 2

- 22. Hemlock

Species Group 3

- 31. Elm
- 32. Black Ash

Species Group 4

- 41. Paper Birch
- 42. Aspen

Species Group 5

- 51. White Pine
- 52. Red Pine
- 53. Jack Pine

Species Group 6

- 61. White Spruce
- 62. Black Spruce
- 63. Balsam Fir

Species Group 7

- 71. Tamarack
- 72. White Cedar

Species Group 8

- 81. Other Commercial Species
- 82. Other Non-Commercial Species

DBH CLASS

Trees Grouped into 2" Diameter Classes

INDIVIDUAL TREE VIGOR

- 1. Good Vigor
- 2. Medium Vigor
- 3. Poor Vigor
- 4. Cull and Chemical

MANAGEMENT POTENTIAL

- 1. Tree species handled under selective cutting practices. Healthy trees that should not be cut.
- 2. Tree species handled under clear cutting practices. Good healthy trees that would be cut if the area were cut.
- 4. Trees that should be cut because they are mature or over-mature.
- 5. Trees that should be cut because they are a poor risk or poor form.
- 6. Trees that should be cut in a thinning.
- 8. A tree that should be cut but is non-commercial due to size.

CONTINUOUS FOREST INVENTORY
1961 REPORT
PREPARED FOR
THE CLEVELAND — CLIFFS IRON COMPANY
BY
GEORGE BANZHAF & COMPANY
MILWAUKEE
DECEMBER 31, 1961



